

REMARKS

Claims 1-19, 21, 26, 28, and 32 have been previously canceled, claims 20, 22, and 31 are currently amended, and no new claims are added by way of this response. Thus, claims 20, 22-25, 27, 29-31, and 33-39 are pending and presented for examination. Applicant respectfully requests reconsideration and allowance of the pending claims in view of the foregoing amendments and the following remarks.

Response To Rejections Under Section 103

Claim 20 stand rejected under 35 U.S.C. § 103(a), the examiner contending that claim 20 is obvious over Richer et al. (US 6,630,645) in view of Mega et al. (US 2004/0169022) and Neil et al. (US 6,809,291).

Claims 22-25, 27, 29-31 and 33-39 stand rejected under 35 U.S.C. § 103(a), the examiner contending that these claims are obvious over Richer in view of Mega and Neil and further in view of Meade et al. (US 6,573,474).

Applicant has amended independent claims 20, 22, and 31 to further clarify the invention. Claims 20, 22, and 31 now recite:

“using a plurality of pulses of longer laser pulse length for rough machining the hole to produce an inner region of the hole;

using a plurality of pulses of shorter laser pulse length for removing an outer upper region of the hole to produce the first region;

using the plurality of pulses of longer laser pulse length to remove remaining first region material and to produce the second region; ...

wherein the inner region is removed using the plurality of pulses of longer laser pulse length after removing the outer upper region, and

wherein the first region comprises a wider cross section than the second region.”
(paragraph 0017, 0033-0034, and figures 5-9).

Regarding to independent claims 20, 22, and 31, the Examiner contends that Richter discloses a method of producing a hole comprising a first region having a flat straight wall region

7 and a remaining second portion 9 which is removed thereafter. Applicant respectfully submits that Richter does not teach rough machining the hole to produce an inner region of the hole and the inner region is removed after producing the first region. By contrast, as what the Examiner contends, Richter only teaches that a hole comprising a first region having a flat straight wall region 7 and a remaining second portion 9 which is removed thereafter.

The Examiner further contends that in view of Mega and Neil, it would have been obvious to one of ordinary skill in the art to adapt Richer with a first short pulse for fast machining of the first region of the hole without cracking and with a second longer pulse for creating a second funnel region having an enlarged area. Applicant respectfully submits that these combinations of the prior art exactly teaches away from Applicant's invention. Applicant claims that using a plurality of pulses of shorter laser pulse length for removing an outer upper region of the hole to produce the first region and using the plurality of pulses of longer laser pulse length to remove remaining first region material and to produce the second region, wherein the first region comprises a wider cross section than the second region. Applicant claims that the first region which is the outer upper region 28 having a funnel shape is produced by shorter laser pulse and the second region which is the inner region 25 is produced by longer laser pulse.


In view of above, Applicant respectfully submits that independent claims 20, 22, and 31 are patentable. Dependant claims 23-25, 27, 29-30, and 33-39 are patentable based on their dependency from independent claims 20, 22, and 31 as well as based on their own merit. Therefore, Applicant respectfully requests the Examiner to withdraw the 103 rejections.

Conclusion

For the foregoing reasons, it is respectfully submitted that rejections set forth in the outstanding Office Action are inapplicable to the present claims and specification. Accordingly, Applicant respectfully requests that the Examiner reconsider the rejections and timely pass the application to allowance. Please grant any extension of time required to enter this paper. The commissioner is hereby authorized to charge any appropriate fees due in connection with this paper, including the fees specified in 37 C.F.R. §§ 1.16 (c), 1.17(a)(1) and 1.20(d), or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

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